

**PIKES PEAK
RADIO AMATEUR
ASSOCIATION
(PPRAA)**

Activities/Meetings

- The December HAM breakfast was at: Black Bear Diner

The January 2nd HAM breakfast will be at New Day Cafe
5901 Delmonico Dr.
Colorado Springs

Join us between 8:00-9:30 AM
All are warmly invited

- PPRAA Board Meeting
Mon, January 11th
- PPRAA Club Meeting,
Wednesday, January 11th
IHOP
5749 Stetson Hills Blvd
- 10 Meter/2 Meter net
Every Thursday 7:00 pm
28.390 MHz—USB
144.200 MHz-USB

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Volume 65 Issue 12

December 2015

HamCon Colorado—Rocky Mountain Division ARRL Convention

What is HamCon Colorado?

HamCon Colorado is the Rocky Mountain Division ARRL Convention. The convention will have activities for everyone with nearly 100 technical forums, wonderful nationally known speakers, and a great environment for meeting your friends and finding new friends. There will be plenty of great exhibits, equipment vendors, and learning opportunities! If you've been to it in the past, this is sure to be the best Rocky Mountain Division Convention ever!

Make sure you also register for your hotel room!

Where?

The location will be the Keystone Conference Center located on Tennis Club Road in Dillon. This is a really nice facility with forum rooms, banquet rooms, exhibit hall, and more. More information can be found on the HamCon Colorado website. To get the HamCon negotiated prices use conference code CK2ARR when registering.

How do I register?

HamCon Registration is open. Browse to the HamCon website and click on the registration tab. The web site is:
<http://www.hamconcolorado.org>

Vacation?

Keystone is a popular vacation location, so there is plenty to do for you and your family. Heck, invite your family's family!

PPRAA Scholarship Fund—Matching Funds

To me, one of the most important activities we do as PPRAA is awarding the \$1,000 scholarship.

The PPRAA scholarship is for a student in, or going into, a hard sciences or engineering related field. Another way to think of this, if the field of study requires a lot of math then this scholarship is one the student should apply for.

towards Amateur Radio licensees that are Colorado students and headed to Colorado colleges and universities. These are preferences, not requirements.

There is a matching fund for up to \$500 in cash donations. Please see the back cover of this Ø-Beat for instruction on how to donate.

The applicant's application is weighted

The depth's of "Doc's" desk

Doc, W0MCT, had saved a clip from the Gazette which read:

"Nov. 26, 1937
Through the courtesy of the Strang garage, the Pikes Peak Amateur Radio

Association will be enabled to enact an emergency radio station in the heart of the business district and within easy access of an almost unlimited supply of direct current electricity independent of power lines."



PPRAA Officers and Board of Directors

PPRAA Board of Directors consists of four elected officers, seven board members, as well as the past president (time limit dependent). The Ø-Beat editor is a board appointed position and is also a member of the board.

Officers include:

- ⇒ President
- ⇒ Vice-President
- ⇒ Secretary
- ⇒ Treasurer

To send board member's email, browse to the officers section of our website: <http://ppraa.org/about-ppraa/officers>

President	Raleigh Holcomb	N4HYF
Vice-President	Rich Milligan	ADØNP
Secretary	John Wishart	NGØI
Treasurer	Pam Scott	WØPRS
Board Member	Dan Martin	KDØSMP
Board Member	Glenn Brodt	N3ULW
Board Member	Frank Roger	KB3PDT
Board Member	Jim Rader	KDØNQM
Board Member	Jim Bishop	KDØKQL
Board Member	Virgil Yost	NØXRS
Board Member	Mike Anderson	WV7T
Ø-Beat Editor	Dan Scott	WØRO
Webmaster	Doug Nielsen	N7LEM

Online Resources

PPRAA Website

<http://ppraa.org>

The PPRAA website is the cornerstone for club related information, events, and technical information.

In addition you can register, pay dues, and submit donations. Donations to the PPRAA college scholarship fund are managed by FAR Scholarship Committee

Facebook / Google+

Follow activities as they unfold, or get reminders of upcoming events.

Links to both Facebook and Google+ social media sites can be found on the PPRAA.org.

Or from each social media site search on: Pikes Peak Radio Amateur Association.

PPRAA Forums

The PPRAA forums are intended to allow users to exchange ideas, ask and answer amateur radio related questions, and plan/discuss upcoming events.

This is a fantastic, but underutilized, tool. Check it out and register at:

PPRAA.Forumotion.net

Monthly Activities

Membership Meeting

Held the 2nd Wednesday of the month starting at 7:00.

IHOP
5749 Stetson Hills Blvd
(Just west of Powers Blvd)

NOTE: Many show up at 6 pm for kibitzing and grub.

Board Meeting

IHOP
5749 Stetson Hills Blvd
Colorado Springs, CO 80906

6:30pm—8:00pm
On the Monday preceding the membership meeting.

Board Meetings are open to all members.

Ham Breakfast

Location changes monthly: Check ppraa.org or table of contents, page I for the breakfast meeting location.

10 Meter/2 Meter Net

Every Thursday at 7pm
Starts on 28.390 USB then transitions to 2 Meter SSB at 144.200 USB.





PPRAA Board of Directors presented Ed Corn, KC0TBE with a plaque of appreciation for all the work Ed has been doing in-and-around the PPRAA club station.

Improving 2-Meter HT Performance in Pedestrian-Mobile Applications

William McFadden, WD8RIF

Introduction

Hams generally don't buy HTs to use exclusively with 14-element yagis mounted atop 75' towers. Hams buy HTs because they need to be able to have a station they can carry in their pocket, briefcase, or glove box; because they need to communicate while away from their hamshack or car; and because they need to be able to communicate while in bipedal-motion. Modern HTs are miracles of technology and packaging. However, let's face it—the cute, short, convenient, easy to carry helical “rubber duck” antennas that come with most HTs are miserable performers. According to tests performed by the National Bureau of Standards, the typical rubber duck antenna is 5dB down when compared to a $\frac{1}{4}$ - λ whip held at shoulder height. This means that the effective radiated power of a 5-watt HT driving a rubber duck is about $1\frac{1}{2}$ watts, and received signals are degraded by a similar amount. However, it's possible to get improved performance from an HT without severely reducing the HT's convenience and utility. This article will look primarily at improving the performance of 2-meter (VHF) HTs, although the methods discussed easily be extended to UHF HTs.

Add a Counterpoise to the Stock Rubber Duck

Because a rubber duck single-band HTs is usually a helically-shortened $\frac{1}{4}$ - λ whip that relies on capacitive coupling to the operator's body for the missing second half of a $\frac{1}{2}$ - λ dipole, one way to slightly improve its performance is to provide the second half of the dipole by operating the rubber

duck against a wire counterpoise or “tiger tail”. A tiger tail is simply a $\frac{1}{4}$ - λ length of wire connected to a point at ground potential on the HT; such a counterpoise can be clipped to the outside of the BNC or SMA connector or it can be attached to a case screw that connects to ground. For 2-meters, a wire counterpoise is about 19” long. Commercially-produced tiger tails are available, but they are also very easy and inexpensive for the average ham to build himself.

The $\frac{1}{4}$ - λ Whip

A $\frac{1}{4}$ - λ whip mounted on an HT is actually half of a $\frac{1}{2}$ - λ center-fed dipole and when used by itself is a considerable improvement over the stock rubber duck. However, because it's only half a dipole that relies on capacitive coupling to the operator's body for the second half of the dipole, the addition of a counterpoise transforms the $\frac{1}{4}$ - λ whip into a full-size center-fed $\frac{1}{2}$ - λ dipole and improves performance by about 5dB over the stock rubber duck. For 2-meters, a $\frac{1}{4}$ - λ whip is about 19” long and the wire counterpoise is the same length. Many commercially-produced $\frac{1}{4}$ - λ whips are available. Most are made of flexible “whippy” material. A home-made $\frac{1}{4}$ - λ whip can be made of hook-up wire inside small-gauge “whippy” plastic tubing.

The full article can be found at:
http://home.frognet.net/~mcfadden/wd8rif/pdf/ht_antennas.pdf

Also, to be continued in the January 0-Beat.



PPRAA Board Meeting Minutes—9 November 2015

PPRAA Board Meeting Minutes
9 November 2015

Present: Raleigh Holcomb, Jim Bishop, Dan & Pam Scott, Mike Anderson, Jim Rader, Virgil Yost, Ed Corn, Rich Mulligan, Doug Nielsen, John Wishart, Glenn Brodt, Diana Nordtrom, John Bloodgood, Frank Rogers, Michael Derbort,

The meeting was called to order by President Raleigh at 6:30PM at the IHOP at Powers & Stetson Hills.

October Minutes were approved as published.

Treasurer's Report

Pam reported that we have \$12,994.35 in our accounts as of October 31.

Committee Reports

Solar Panels

One panel will be provided to Mike Anderson for use in training. We are considering giving some panels to the Deep Space Exploration Society in NM. Also some may be available to club members. Motion made/seconded to donate four panels to DSES, one to Mike Anderson for training purposes, and one to be raffled off to club members. Passed.

Towers & Antennas

We are considering putting up another tower for a log periodic antenna we have. We currently don't have a complete tower to support this item, however. We need three sections of Rohm 45 for the support. Also considering donating the sections we have to CMRG. Item was tabled. The rotor currently in use at the club station needs repair. It has loose parts inside.

Megafest Report

Prizes - Jim Rader will be getting the prizes soon. Recommended to allot up to \$3K for Megafest prizes. This will be voted on at the general meeting.

Date: TBD. Motion made/seconded to have the event on July 9, pending approval from LPHS. Passed.

Christmas Party

This will be at the Country Buffet Restaurant on South Academy near the Citadel Mall, Dec 9. Motion made/seconded to spend up to \$350 for door prizes. Passed.

Winter Field Day

We have this special event this winter. Date TBD.

Tie downs are needed on the trailer and the barn. Skirting is also needed. Dan has some T-posts to donate for this task.

Around the Table

Glenn - shirts. wants to know what to do about the shirts ordered. Moved/seconded to pay for shirts not to exceed \$499. Passed.

Raleigh - need to have a checklist for closing up the club station. Discussed how to get access to the club station. Need a policy to track who has the combination to the trailer door lock.

Mike A - Will be holding a three-day event this weekend. QSO Operation at the club station (AF0S). Suggested that the club get an antenna analyzer. Also needs to get QSL cards for this event.

Virgil - OK with a dues raise.

Mike Derbort - will continue to administer the scholarship activity

John Bloodgood - will still take volunteers for Thanksgiving and Christmas events.

Next Board meeting: Monday, 7 December 2015, 6:30PM at the IHOP at Powers & Stetson Hills.

The meeting was adjourned at 8:03 PM.

Respectfully submitted,

John Wishart

PPRAA Secretary

22 November 2015

PPRAA General Meeting Minutes—11 November 2015

The meeting was called to order at 7:00PM by President Raleigh Holcomb at the IHOP Restaurant near Stetson Hills and Powers Blvd. Approximately 37 members and guests were present.

Silent Keys: Virgil Yost thanked us for the card for his mother's passing. Mike Anderson's father passed away a couple of weeks previous.

Solar Panels

Eight solar panels are not currently in use at the club station. We are considering donating four panels to the DSES facility at Haswell, NM. Motion made/seconded to donate four panels to the Deep Space Exploration Society. Passed.

Megafest

Prizes - motion made/seconded to allocate up to \$3K for Megafest raffle prizes. Passed. Contact Jim Rader if you have suggestions for the prizes.

Christmas Party

7PM, Wednesday December 9 at Country Buffet near Platte & Academy.

Club Station

Trailer has been moved & planted. A small barn has been installed. Other installed items are two folded dipoles, 2m J-pole, Butternut, remote radio, 3-element beam on the tower, rotor on tower (needs repair), G5RV, inverter, solar panels w/ controller, to support the three operating positions. Available to use for club members after training. Checklist will be available.

Our 10'x15' barn at the club station has been painted by Rich and Ernie. Thanks to both of you.

Tiedowns are needed for the barn and the trailer. It was suggested to use T-posts (8) plus some chain or cable.

At Raleigh's suggestion it was moved/seconded to provide Ed Corn a plaque to thank him for all his work at the club station. Passed. Skip donated \$100 for a gift card to give to Ed also.

Treasurer's Report

No report this evening.

Minutes were approved as published.

Winter Field Day, Jan 30-31.

COQP Contest

Doug reported that results will be available on our website tomorrow AM.

Hamcon

Doug reported this will be held next May in Keystone CO. Will be able to register and reserve rooms around the end of the year.

Education

Mike Anderson noted that he has instruction and classes available for Tech and General class licenses, plus Morse code. He is also organizing a QSO weekend this coming weekend. Mike has also volunteered to coordinate Field Day. He is going to try to have a special event every month.

ARES Report

John Bloodgood reported on recent ARES activities, including an SET and an Army MARS exercise. He also requested more volunteers for the upcoming Salvation Army dinners on Thanksgiving and Christmas. John encouraged phone calls to your congressmen about the Amateur Radio Parity Act. He mentioned that EOSS will be launching a couple of high altitude balloons this weekend.

T-Shirts

Glenn reported that shirts are being ordered. If you have not paid as yet, please pay up. They will be in a couple of weeks.

Program

Kevin Polk presented a talk on Electromagnetic Pulse (EMP) events, their causes and effects.

Upcoming Events

Next Board Meeting: Monday, 7 December 2015, at IHOP Restaurant at Powers & Stetson Hills, 6:30PM.

Annual Christmas Party, Wednesday, 9 December 2015, 7PM, at Country Buffet Restaurant on South Academy near the Citadel Mall.

Next PPRAA regular meeting: Wednesday, 13 January 2016, 7PM at IHOP.

The meeting was adjourned at 9:15 PM.

Respectfully submitted,
John Wishart
PPRAA Secretary
11 November 2015





ISOTRON 15 or 12

ENJOY THE WORLD OF DX

Columnist Ralph Bilal,
WDØEJA is the
president of Bilal
Company. Ralph has
been a presenter at the
PPRAA club meetings.

Making a small regulated power supply

I have been publishing this technical article since January of 2013. For the past 35 years I have manufactured the Isotron Antennas. This also involved helping many with their very difficult installations. Some of the information will be from what we learned solve these problems. Some information will be right from a text book or credible article.

You are welcome to contact me at wd0eja@isotronantennas.com with question you may have.

MAKING A SMALL REGULATED POWER SUPPLY

There are times when we need a well regulated low wattage power supply. Say no more than 15 watts. This is good for operating a hand held transceiver, antenna analyzer, trickle charger, audio amp, relays and more. What can you use and what parts work well?

There are several solid state regulator devices. To start, the easiest to use is the LM78xx or LM79xx series. You find these as low as 50 cents each. These will handle 1 to 1.5 amps at the voltage you select.

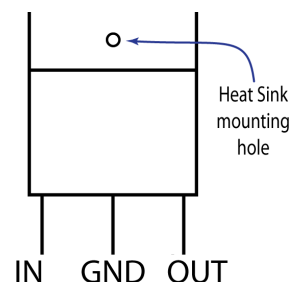
If you want a + voltage, then select the LM78xx series. A - voltage, the LM79xx series. The xx is the voltage desired. A LM7805 will supply a 5 volt + source. A LM7905 provides a 5 volt - source.

These devices are normally a TO-220 case. What is that?

This is a case of a flat rectangular wafer, about 3/8" width, 5/8" length and 3/16" thick. It is made to mount on a heat sink, however for currents within its range, the heat sinks are seldom used.

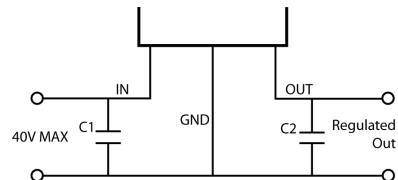
There are 3 leads coming out the 3/8" side of the wafer. If you position the wafer so the lettering is toward you and the leads are toward you, it is easy to determine the function of each lead. The

lead to your left is the Input. The center lead connects to Ground or the opposite polarity. The right lead is your regulated Output.



The "IN" lead can be supplied with as high as 40 volts. This will need to be a rectified voltage with a + polarity for the 78 series. A small transformer or wall wart can be used. If a transformer is used, a full wave rectifier should be next in the circuit. This voltage can be filtered with an electrolytic capacitor of at least 500 mf (C1) across the rectifier.

The "OUT" lead should have a filter capacitor (C2) of 1,000 mf or more.



This simple circuit will provide you with a very stable and smooth rectified voltage of your selection.

73,
Ralph WDØEJA
December 2015

PH/FX: 719/687-0650

Are Kids the Future of Ham Radio?

You've heard it a million times: our kids are the future. That statement gets applied to almost everything, including amateur radio. How can you argue with an obvious fact like that?

But I am starting to think it is incorrect.



We've had really good success on creating new hams of all ages in our Technician License Class (at the Tri-Lakes Monument Radio Association).

We've been doing this for a while now and I think I am seeing a pattern emerge. We've been able to attract middle schoolers to the class and help them get their ham radio license. I've talked to many of them on the air. They've helped out with public service events. They seem to have fun playing with radios.

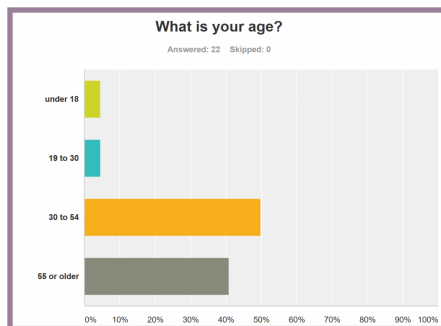
Then this thing called high school happens. The high school phase in the US is filled with tons of stuff to do: studying, homework, AP classes, science competitions, sports, dating, movies, driving and after school jobs. Way too much stuff. Ham radio starts to take a backseat to these normal high school activities. Then we don't see the kids at the radio club meetings or chatting on the local repeater because they are busy doing other things. Have we lost them forever? Not sure.

High school is often followed by college which has its own set of challenges: a totally new environment, away from home, a new set of people, new studies, etc. There might be a ham radio club on campus but maybe not. If a kid is not off to college they are (hopefully) out doing something to establish themselves in this world. Eventually they emerge on the other side, get a job, get themselves established, sometimes with a spouse and maybe a kid or two. By this time they are 25 to 30 years old, depending on the individual.

I recently posted about the demographics of our students in the Tech License Class. The chart below shows the age distribution of our students from our most recent class. Hmm, clearly most of our students are 30 or older. (Sorry, we have not collected age data with finer resolution.) This particular class is light on the under 18 crowd... sometimes we have a clump of kids in the mix.

For whatever reason, it seems that most people find

themselves in a situation as an adult that causes them to say "I want to get my ham



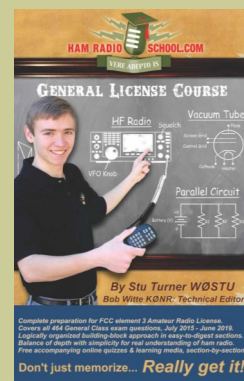
radio license." When asked why they want to get their ham license, the top response is always emergency/disaster communications, followed by backcountry communications, pursuing electronics as a hobby and learning about radio communications. I suspect that starting to be established in a community and having some disposable income also play a role.

My hypothesis is that the most effective way of growing a vibrant ham radio community is to target adults ages 25 to 40.

This age range is more equipped and ready to be ham radio operators and are still young enough that they will be around for a while. Of course, we still want to work with all age groups, including kids and retirees. We've all seen very young hams get the bug for ham radio early and carry it throughout their life. And we also see plenty of older folks get interested in the hobby as they approach or enter retirement. We don't want to miss out on either of those groups.

So that's my read on the situation. I've got some data to support my theory but I can't really prove it. What do you think? What are you seeing in your ham radio community?
73, Bob KØNR

Bob Witte, KØNR, blogs about amateur radio at KØNR.Com. You can find this post at <http://www.k0nr.com/wordpress/2015/11/kids-not-the-future/>. You can e-mail him at bob@k0nr.com. He is also on Twitter: @KØNR.



Bob, KØNR, has something to do with the above exceptional licensing course.



VE Testing & Education—Colorado Springs (PPRAA)

Pikes Peak Radio Amateur
Association (PPRAA)

When:

Feb, Apr, Jun, Aug, Oct, Dec
2nd Saturday at 9 AM

Location:

7075 Campus Dr.
Colorado Springs, CO 80920

Directions available
at:

ppraa.org/ve-testing

or contact:

Dennis Major



VE@PPRAA.org

Mike Anderson, WV7T does
personal and small group
training for all license classes.

Mike also does Morse code
training.

Mike can be reached at:
719-229-8610
vv7t@aol.com

VE Testing Woodland Park (MARC)

MOUNTAIN AMATEUR
RADIO CLUB (MARC)

When:

Jan, Mar, May, Jul, Sep, Nov
1st Saturday at 10 AM

Location:

Woodland Park
Woodland Park Library-
Community Meeting RM
218 East Midland Avenue

Directions:

<http://www.nx0g.org/ve.html>

or contact

Wes Wilson (KØHBZ)
k0hbz@arrrl.net
Call (719) 687-8758



Applicants will need the following items:

1. A valid PHOTO ID, driver's license preferred (if you do not have a valid photo ID, please call for alternative identification requirements).
2. Your FRN or SOCIAL SECURITY NUMBER (now required – this includes children).
3. Your CURRENT ORIGINAL amateur radio license (if any) and a PHOTOCOPY for the VE Team to keep.
4. The CURRENT ORIGINAL CSCs you have and a PHOTOCOPY for the VE Team to keep.
5. Cash, Check or Money Order for \$15 (standard ARRL VE Fee). Checks and money orders should be made out to ARRL. This covers all exams you wish to take at this VE session.

Teams, is to not allow same day retests on failed exams.

PPRAA – Colorado Springs testing only:

Anyone passing their Technician Class examination at a PPRAA test session will receive a free year's membership to the Pikes Peak Radio Amateur Association

NOTE: PPRAA and MARC VE Team policy, as with many VE

Activation National Parks on the Air (NPOTA)

A section from ARRL.org:

Activating an NPS Unit for NPOTA

1. What bands and modes may I use?

- a) All amateur bands are permitted, except for 60 meters. Cross-band QSOs, QSOs made through repeaters, digipeaters, Echolink, IRLP, or any communications network that relays inter-station communication by non-amateur means do not count. A specific exemption is granted for QSOs made through the Amateur Radio satellites and the International Space Station.
- b) Any mode may be used.
- c) Remember that the NPOTA awards do not keep track of QSOs by band or mode. Only one verified QSO is needed on any band or mode to get credit for that NPS unit.
- d) The use of a remote station is permitted for Chasers. Activators and all their station equipment must be physically present in the unit they are activating.

2. What is required for my activation to be considered "official?"

For your activation to count toward your Activator Award, the following items must be met:

- a) You must make a minimum of 10 QSOs during your activation.
- b) All station equipment must be physically present in the NPS unit you activate.
- c) You must upload your log to Logbook of The World (LoTW) as soon as is practical.

3. How do I prove I was actually at the NPS Unit I activated?

While it is unlikely that ARRL will ask for documentation, ARRL reserves the right to ask for verification of any claimed operation from an NPS Administrative Unit. As an Activator, you should secure as much documentation as possible to verify that your operation was legitimate. Some ways to do this are:

- a) An official stamp from the NPS unit's "NPS Passport Program." This is a free date/location stamp available at most NPS units, at the unit's main Visitors Center or Ranger Station. This is the preferred method of verification. More information on the NPS Passport Program is available at www.eparks.com.
- b) A photo of yourself in front of the NPS unit's main sign or distinguishing landmark.
- c) Image of GPS latitude/longitude coordinates.

4. What kind of station should I bring on my activation?

- There's no one answer to that question. A lot will depend on which NPS unit you try to activate and how many people will be there when you try to set up. Some sample station configurations include:
- Operating from your car or RV with a mobile antenna affixed to the vehicle.
- Using a radio at a picnic area with a push-up mast and a simple wire antenna.
- "QRP portable," with a small transceiver and a simple wire antenna.

Some sites will have restrictions on whether the ground can be modified. Others will be in highly urban areas and may offer no easy way to erect an antenna. Be flexible, prepare for multiple setup scenarios if possible, and always follow the rules as outlined by an NPS Administrative Unit's guidelines or staff.

5. Can I use trees at NPS units to hold up wire antennas?

This will vary from site to site. Some sites specifically prohibit tying any ropes to trees. We strongly suggest doing research before activating an NPS unit and bringing a portable mast for your antenna, in case using trees is prohibited.

6. Do I need a special use permit to operate my Amateur Radio station in an NPS unit?

This will vary from unit to unit. A lot will depend on your operating style. If you plan on operating strictly from your vehicle with a mobile antenna on the roof, or with a small station in a campground, you may not need a special use permit. If you are planning a large operation with big antennas, or want to operate from an NPS unit we have deemed as "sensitive," the odds you will need a special use permit increase dramatically. Do not expect to roll in to an NPS unit with a tower trailer and a kilowatt HF station without prior approval. If you have any doubts, ask in advance.

7. If I go to the same NPS unit several times during the year, how much time must go by between activations?

A period of 24 hours must go by between operating sessions at the same NPS unit for it to be considered a new activation

For more information on NPOTA see the ARRL page at:

<http://www.arrl.org/files/file/On%20the%20Air/NPOTA/NPOTA-Activator-Guide.pdf>

National Parks
ON THE AIR
2016
www.arrl.org

PIKES PEAK RADIO
AMATEUR
ASSOCIATION

Send membership application to:

Pikes Peak Radio Amateur
Association, Inc.
P.O. Box 16521
Colorado Springs, CO 80935

General Questions:
ppraa@ppraa.org

ØBeat:
zerobeat@ppraa.org



ppraa.org

Get Radio Active, get on the air!

Membership Application:

Date: ____ / ____ / ____ New Membership: Yes / No

Name: _____

Address: _____

City/State/Zip: _____

Call: _____ Class: ____ Phone # (____) _____

Email: _____

Are you a ARRL member: Yes / No

Additional Family Members:

Name1: _____ Call: _____ Class: ____ ARRL Member: Yes / No

Name2: _____ Call: _____ Class: ____ ARRL Member: Yes / No

Name3: _____ Call: _____ Class: ____ ARRL Member: Yes / No

____ \$15.00 Full Member

____ \$10.00 Full Member over 65

____ \$18.00 Family Membership

____ \$12.00 Family Membership over 65

\$____ Membership Amount

\$____ Scholarship Fund Donation

\$____ PPRAA General Fund Donation

\$____ Total

2015 Scholarship Fund

This last year the donations to PPRAA Scholarship Fund have been slipping.

The scholarship is for a hard science or math related field of study. Those fields of study are, or are similar to, Physics, Chemistry, Math, Electrical Engineering, Bio Engineering, etc.

There are many ways to make your tax deductible donation to this fund. Contributions may be made via:

⇒ [PPRAA website \(http://ppraa.org\)](http://ppraa.org)

⇒ Part of your membership renewal,

⇒ Club meetings and event.

⇒ Directly to the fund at:
FAR Scholarship Committee
P.O. Box 911
Columbia, MD 21044

**Make checks to:
PPRAA Scholarship**

Ø- Beat Banner

Photo by Dan—WØRO.

This photograph was taken in December.

The theme of the banner is Pikes Peak Region.

If you would like to submit pictures for the Ø-Beat banner, please send them to:
zerobeat@ppraa.org

Please Include "[Ø-beat]" as part of the subject line.